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# Food & Nutrition Research News Briefs

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## Nutrition and Health

The role of vitamin C in preventing bleeding and inflamed gums--two early signs of gingivitis--has been confirmed in a closely controlled human study. Gingivitis is currently the major cause of tooth loss in U.S. adults over 40. When volunteers increased vitamin C intake from 5 mg to about 60 mg per day--the Recommended Dietary Allowance--their gums bled less and were less inflamed when probed. These symptoms were further reduced when vitamin C intake was increased to slightly more than 600 mg, or 10 times the RDA. The results confirmed findings by other researchers that vitamin C is needed to maintain healthy gums. Biochemistry Research Lab, Western Human Nutrition Research Center, San Francisco, CA  
Robert A. Jacob, (415) 556-3531

A potent hormone--the activated form of vitamin D--may be useful for treating the scaly, itchy skin disease known as psoriasis. Of 16 psoriasis patients who had not responded to other therapies, 12 had substantial or complete clearing of the unsightly patches of skin from topical applications or oral doses of the hormone. The preliminary findings are an important first step toward understanding and treating a disease that has baffled medical researchers. Human Nutrition Research Center on Aging at Tufts, Boston, MA  
Michael F. Holick, (617) 556-3176

More evidence that gender influences the consequences of copper deficiency comes from a study of male and female rats. Copper deficiency reduced circulating

iron in both sexes but had a greater effect on the males' hemoglobin and another clinical indicator of iron status, hematocrit. Giving rats excess iron improved these measurements in females but not in males. Similar differences occurred in the immune system. Copper deficiency depressed the activity of T lymphocytes--key players in the immune response--to a greater extent in the males. Grand Forks Human Nutrition Research Center, Grand Forks, ND  
Tim R. Kramer, (701) 795-8399

The way people walk may prove to be a clue to vitamin B6 deficiency, if preliminary results with lab rats hold true for humans. Lab rats who had been on a vitamin B6-deficient diet for only 9 days began to have problems with the way they moved their hind legs. Such "gait analysis" is sometimes used by toxicologists to screen pharmaceuticals. Vitamin B6, found in such foods as whole grain products and liver, is used in the body to manufacture essential proteins, fats, and carbohydrates. In the United States, females over age 15 and elderly men are the most likely to be deficient in this vitamin. Nutrient Intake and Performance Lab, Western Human Nutrition Research Center, San Francisco, CA  
Monica C. Schaeffer, (415) 556-5655

New equations are being developed to enable nutritionists to better estimate the ratio of body fat to lean for black Americans. Equations now in use were developed a number of years ago from a sample of white men and women, and a recent ARS study of 92 black men and women reveals that the old equations are poor predictors of body fat for black

people. The new equations for black Americans can be used with three common methods for predicting fat-to-lean ratios: (1) measuring skinfold thickness at nine body sites, (2) measuring circumferences at similar sites, and (3) measuring body impedance by passing a harmless, painless electric current through the body. The resistance to the current is proportional to the amount of lean tissue one has.

Energy and Protein Nutrition Lab,  
Beltsville Human Nutrition Research  
Center, Beltsville, MD  
Joan M. Conway, (301) 344-2977

Contrary to some dietary advice, eating several small meals each day may not help burn up more calories than eating the same amount of food in only one or two large meals. A study showed that the rate at which the body uses calories in foods during digestion was essentially the same, whether volunteers ate two large meals or ate the same amount of food at several smaller meals. Although the smaller meals may have some physiological and psychological benefits for dieters, and may be a necessity for people with diabetes or other disorders, splitting the day's intake into smaller meals may not, by itself, boost the rate at which the body uses up calories.

Body Composition and Energy Metabolism  
Lab, Western Human Nutrition Research  
Center, San Francisco, CA  
Amy Z. Belko. (415) 556-5695

A carrot a day may not prevent night blindness if protein or calorie intake is well below desirable levels. Young rats lost their ability to see in dim light when kept on diets very low in protein or somewhat low in protein and very low in calories, even though eye levels of vitamin A remained normal. A nutritionally complete diet restored night vision in both groups.

Human Nutrition Research Center on Aging  
at Tufts, Boston, MA  
Robert M. Russell, (617) 556-3336

Foods prepared from immature field or sweet corn may benefit people, including many Latin Americans, whose diets consist mostly of cornmeal. Such diets may provide low amounts of niacin, thus increasing the risk of pellagra, caused by deficiency of this B-complex vitamin. As corn matures, researchers found, niacin is converted from digestible forms into forms that lab animals cannot digest. Sweet corn, which is harvested and consumed at the immature, "milky" stage, has a high level of nutritionally available niacin. Field corn, harvested at maturity, does not. Studies showed both types were rich in available niacin when harvested at similar stages of maturity.

Plant Protein Research, Northern  
Research Center, Peoria, IL  
Jerold A. Bietz, (309) 685-4011,  
Ext. 594

The anticoagulant used to prepare blood plasma samples can affect the accuracy of chemical analysis--the most common method of assessing human health and nutritional status. In a comparison of two commonly used anticoagulants, citrate pulled fluid from blood cells, diluting the plasma sample by about 10%, whereas heparin did not. This dilution accounted for a 10% error between plasma and serum concentrations in 13 clinical tests--including trace elements, vitamins, proteins, and lipids. (Plasma contains the clotting factor absent in serum.) The discrepancy between citrated plasma and serum analyses--previously thought to be interchangeable data--must also be taken into account when comparing groups in large nutritional or epidemiological studies or in following the same individuals in long-term studies.

Vitamin and Mineral Nutrition Lab,  
Beltsville Human Nutrition Research  
Center, Beltsville, MD  
J. Cecil Smith, (301) 344-2022

## Tomorrow's Foods

Cake lovers could have their low- or no-salt cake and eat it too--and it can be just as tasty as a cake made from saltier mixes. This was true in a study of salt in white, yellow, spice, and devil's food cakes. The research showed that flavor of salt-free cakes was as good or better than salted cakes and that processors may be able to avoid some problems of low- or no-salt cake mixes--more shrinking and less firmness--by making other processing changes. Eating less salt can help control high blood pressure.

Food Science Research, Eastern Research Center, Philadelphia, PA  
Virginia H. Holsinger, (215) 233-6589

Changing the sex of a female lamb to male before it's born can mean gaining an extra pound per week on 16% less feed. In the first study of its kind to improve growth in lambs, male sex hormone--testosterone--was injected into pregnant ewes 4 weeks after breeding. Female embryos in test ewes developed male-like genitals. Although the altered lambs thrived, they were unable to reproduce when they reached maturity. U.S. Meat Animal Research Center, Clay Center, NE  
John Klindt, (402) 762-3241

The growing blueberry industry can expect three new varieties this spring. All are early ripening highbush berries superior to present varieties. Although highbush blueberries are predominantly grown in the north where they receive adequate chilling in winter, Cooper and Gulf Coast have a low chilling requirement, making them ideal for southeastern growers. Duke, a northern highbush blueberry that combines plant vigor and high productivity with good fruit quality, grows well in the Mid-Atlantic area, westward to southern Michigan, and

in western Oregon and Washington. Small Fruits Research, Poplarville, MS  
James M. Spiers, (601) 795-8751/  
Fruit Lab, Horticultural Science Institute, Beltsville, MD  
Arlen D. Draper, (301) 344-3571

Commercial and wild tomato plants are providing scientists with valuable clues to how plants survive in salty water. Commercial tomatoes have a natural mechanism to block out some salt from water the plants take in. Their wild ancestors take salt in but concentrate it in older leaves. By storing salt in specific plant parts, wild plants can withstand saltier water than their modern cousins. To gain information that would lead to more salt-tolerant crops, scientists are now studying the two different survival mechanisms by comparing ATPases--plant enzymes--found in various parts throughout the plant and analyzing the cellular biology of tomatoes.

U.S. Salinity Lab, Riverside, CA  
Michael C. Shannon, (714) 683-5733

Southern Delite, a new sweetpotato variety, will help farmers lower their growing costs. The new variety, based on 7 years of tests, sprouts better and requires less chemical pesticides than other sweetpotatoes. When exposed to root-knot nematodes, Southern Delite had 28% higher yields than a leading variety called Centennial. The new sweetpotato, developed in cooperation with the South Carolina Agricultural Experiment Station, should be available to farmers on a limited basis in the spring of 1987. U.S. Vegetable Lab, Charleston, SC  
Alfred Jones, (803) 556-0840

## Food Safety and Freshness

Potato-chip addicts may rationalize their habit with the Atlantic potato, an ARS variety that makes chips with lower fat content than chips from any other variety. After only 5 years of large-scale production, Atlantic is the third most popular chipping potato in North



America. Usually, when potato chips are deep fried, fat replaces the water in the raw chips. Atlantic chips, however, absorb less fat than other varieties because Atlantic has the lowest ratio of water to solid tissue. Potato chip makers prefer the Atlantic because they get more chips per pound from varieties with a high proportion of solid tissue. Vegetable Lab, Beltsville, MD  
Raymon E. Webb, (301) 344-3380

A tiny wasp native to southern California devours up to 95% of the eggs laid by the beet leafhopper but doesn't bother people. Scientists are now closely studying the biology of the beneficial insect to develop ways to mass-rear them in labs. They could then release enough wasps to control leafhoppers and their relatives that threaten vegetables with curly top virus and citrus with stubborn disease. Several other members of this helpful insect species have been imported from Europe and South America in hopes of finding insects even better suited for leafhopper control. Each year, curly top destroys about \$5 million worth of California vegetables like beans, tomatoes, and cucurbits despite a \$1 million leafhopper control program. Stubborn disease annually ruins California and Arizona citrus worth about \$15 million.  
Boyden Entomology Lab, Riverside, CA  
Dale E. Meyerdirk, (714) 351-6741

Add sweetpotato weevils to the growing list of pests that can be monitored and controlled by pheromones (chemical attractants). The major female-produced pheromone of the sweetpotato weevil has been isolated, identified, and successfully synthesized. In field tests, the synthetic pheromone attracted as many males to traps as did the natural scent. The synthetic pheromone offers farmers a sensitive lure to trap a devastating pest that is hard to see because the larvae feed underground and the adults feed at night. (PATENT)  
Insect Chemistry Research,  
Gainesville, FL  
Robert R. Heath, (904) 374-5735

Nonfat dry milk illegally adulterated with cheaper whey proteins will be easier to spot with a test that "fingerprints" milk proteins. Each type of milk protein moves to a different position on a special gel when an electric current is applied, allowing scientists to identify the pattern later. The test is a new use for a common lab procedure, gel electrophoresis. When nonfat dry milk is diluted with whey proteins, electrophoresis provides absolute evidence of adulteration. USDA's Agricultural Marketing Service may use the test to ensure that nonfat dry milk is not diluted with whey.  
Food Science Research, Philadelphia, PA  
Jay J. Basch/Edyth L. Malin,  
(215) 233-6444

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**Note to editors:** For further information or assistance, contact Judy McBride, ARS Nutrition Editor, (301) 344-4095.

**Publication available.** The USDA Comprehensive Plan for a National Food and Nutrition Research and Education Program, mandated by Congress, is now off press. Fourteen agencies and offices within the department contributed to the 91-page report detailing what is being done and what needs to be done to insure that the U.S. food supply and dietary guidelines lead to better health and a longer, more active, and more satisfying life. For a free copy, write Judy McBride, ARS Information Staff, Bldg. 005, BARC-West Beltsville, MD 20705, or call me at (301) 344-4095.